Over de L-satellieten in het Röntgenspectrum

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SUMMARY.

It is shown that in agreement with the theory of COSTER and KRONIG the excitation of the doubly ionised state $L_{III}\,M_{IV,V}$, which is responsible for the emission of satellites on the short wave length side of the Lα-line, in the region of atomic number below 50 is mainly due to the radiationless transition $L_I \rightarrow L_{III}M_{IV,V}$.

For this purpose three sorts of experiments were carried out:

1. The excitation potential of the Lα-satellites of Nb (41) and Mo (42) was determined by measuring the intensity of the satellites relative to that of the parent line as a function of the voltage. It was found that the satellites of Nb and Mo begin to appear at 2695 $\pm$ 25 volts and at 2885 $\pm$ 25 volts respectively, which is close to the excitation potential of the L_I-level of these elements (see fig. 6 and 7, chapter IV).

2. The relative intensity of the Lα-satellites of Mo excited with AgL- and with CuK-rays was compared to the relative intensity of these satellites in the case of cathode-ray excitation (see table III, p. 00). It could be shown that the relative intensity of the satellites with both modes of excitation is about the same in contrast to the results of other authors for the K-satellites, which are much more pronounced with cathode ray excitation. To obtain a control, the K-satellites of S were produced by fluorescent excitation and compared with that excited by cathode-rays because the initial states for them have about the same energy as the initial states of the L-satellites of Mo. These experiments confirmed the statement made above. It hence may be concluded that the process chiefly giving rise to the Lα-satellites of Nb and Mo is of a nature different from that responsible for the occurrence of the K-satellites of S.

3. The intensity of the Lα-satellites of Ag relative to the parent line was determined with a thin target. It was found that in the region between twice and 3.8 times the excitation potential of L_I this relative intensity increases by 8 per cent (see fig. 12, chap. IV). If the Lα-satellites are indirectly due to the excitation of L_I, this is what may be expected, because COSTER and VAN ZUYLEN have shown that the relative probability for the excitation of L_I and L_{III} in the case of W increases with the voltage, though in the case of W this increase is more pronounced.